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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,924	12/07/2001	Hsin-Hong Huang	10541/775	1505

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EXAMINER	
GARCIA, ERNESTO	

ART UNIT	PAPER NUMBER
3679	

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,924	HUANG ET AL.	
	Examiner	Art Unit	
	Ernesto Garcia	3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-25 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-25 and 30-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

A drawing was received on 2/17/04. This drawing includes changes acceptable as the drawing overcomes the objections stated in the final office action. However, due to further review and understanding of the invention, Figure 10 has a discrepancy as follows.

The drawings are objected to because Figure 10 is out of proportion in respect to the line X, as shown in the attachment A provided herein, not joining at the intersection Y. The examiner has provided what Fig. 10 should be.

The drawings are objected to under 37 CFR 1.83(a) because they fail to show the first direction and the opposite direction of the torsions of portion 30a and 30c as described in the specification (paragraph 024). Furthermore, the portion 30c being machined with a second twist equal and opposite to that given to section 30b in Figure 5 as disclosed in paragraph 023 needs to be shown. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 4, 9 and 10 are objected to because of the following informalities:

regarding claim 4, the recitation "first twisted portion" should be --first twist--;

regarding claim 9, the recitation "having" in line 3 should be --with--; and,

regarding claim 10, "driven" in line 2 should be --driving--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3-8, 14-25, 30, 32 and 33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1, 14, 20 and 30, the original disclosure does not have support for the exact twist of 10' to 1 degree. The original specification has support for "about 10' to about 1 degree" subject to approximation versus exactness.

Regarding claim 4, the disclosure fails to disclose the twisted portion 30b comprising a first twist in a first direction and a second twist in a direction opposite the first twist[ed portion]. By the look of Figure 5, portion 30b has one twist in one direction. Portion 30c cannot be a twist since portion 30c is plain straight without a twist.

Regarding claims 3-8, these claims depend from claim 1 and therefore contain subject matter not disclosed in the specification.

Regarding claims 15-19, these claims depend from claim 14 and therefore contain subject matter not disclosed in the specification.

Regarding claims 21-25, these claims depend from claim 20 and therefore contain subject matter not disclosed in the specification.

Regarding claims 32 and 33, these claims depend from claim 30 and therefore contain subject matter not disclosed in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9, 11-14, 16-25, 30, 32 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Vasudeva, 5,927,165, and Mezey, 3,733,937.

Regarding claim 9, Vasudeva discloses, in Figure 2, a method of interfacing a driving member (the driving member is not shown but disclosed to be a fastener; Mezey is cited to show the driving member interfacing with a driven member), and a driven member **1**. The method comprises:

provide the driving member with a polygonal length and the driven member with a matching polygonal length. The driving member or the driven member **1** has a portion **6** of the length twisted from 10' to 1 degree between two straight portions **A9** along an axis **A5** of the length; and,

join the driving member with the driven member **1** (Mezey is relied upon Vasudeva's intention). Note, Vasudeva teaches an amount of twist from 0 degrees to 360 degrees as a possibility.

Regarding claim 11, the driven member **1** comprises a shaft having a male polygonal length.

Regarding claim 12, the driven member **1** comprises a shaft having a male polygonal length with at least one portion of the length twisted from about 20' to about 50'.

Regarding claim 13, the driving member and the driven member **1** comprise one of a group consisting of a compressor, a pump, a machine tool, a mechanical drive, a generator, and a motor. Both the driving member and the driven member **1** comprise a machine tool.

Regarding claim 14, Vasudeva discloses, in Figure 2, a coupling comprising a shaft **1**, and a mounting device (the fastener as disclosed by Vasudeva). The shaft **1** has a polygonal length selected from the group consisting concave, convex and straight surfaces. The mounting device has a matching polygonal length. The shaft **1** or the mounting device has a portion **6** of the polygonal length twisted from 10' to 1 degree

between two straight portions **A9**. Vasudeva teaches an amount of twist from 0 degrees to 360 degrees is possible.

Regarding claim 16, the polygonal length of the shaft comprises a male polygonal length with the portion of the length twisted from about 20' to about 50'.

Regarding claim 17, the polygonal length has a relative eccentricity of from about 1.5% to about 4%.

Regarding claim 18, the shaft or the mounting device is straight.

Regarding claim 19, Vasudeva suggests that the polygonal length can be a Torx shape thus a concave polygonal length. Therefore, the shaft has a concave male polygonal length with a number of sides selected from the group consisting of 3 to 12.

Regarding claim 20, Vasudeva suggests a coupling comprising a driving member and a driven member **1**. The driving member has a polygonal length and the driven member **1** has a matching polygonal length. A portion **6** of the driven member **1** has a twist from 10' to 1 degree between two straight portions **A9**. Vasudeva teaches an amount of twist from 0 degrees to 360 degrees is possible.

Regarding claim 21, the driving member is selected from the group consisting of an axle, a half axle and a shaft.

Regarding claim 22, the matching polygonal length comprises a male polygonal length including a twist from about 20' to about 50'.

Regarding claim 23, the polygonal length has a relative eccentricity of from about 1.5% to about 4%.

Regarding claim 24, the driving member is a shaft having a concave male polygonal length with a number of sides selected from the group consisting of 3 to 12.

Regarding claim 25, the driving member or the driven member **1** is straight.

Regarding claim 30, Vasudeva teaches an interface between a driving member and a driven member **1**. The driving member has a polygonal length having at least one surface selected from a group consisting concave and convex surfaces. The driven member **1** has a matching polygonal length. The polygonal length or the matching polygonal length has a twisted portion **6** between two straight portions **A9** along an axis **A5** of the polygonal length or the matching polygonal length. The twisted portion **6** is twisted from 10' to 1 degree. Vasudeva teaches an amount of twist from 0 degrees to 360 degrees is possible in Vasudeva's invention.

Regarding claim 32, at least one of the polygonal lengths has a relative eccentricity of from about 1.5% to about 4%.

Regarding claim 33, the driven member is a shaft having a male polygonal length with a number of sides selected from the group consisting of 3 to 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens, 2,634,991, in view of Dymerski et al., 6,533,235 (see marked-up attachment).

Regarding claim 1, Stevens discloses, in Figure 4, an interface between a driving member **17** and a driven member **18**. The driving member **17** has a polygonal length having at least one surface selected from a group consisting concave and convex surfaces. The driven member **18** has a matching polygonal length. However, Stevens fails to disclose the polygonal length or the matching polygonal length includes a twisted

portion **30** twisted along an axis **A5** of the polygonal length **38** or the matching polygonal length **A4**; and, the twisted portion twisted from 10' to 1 degree along the axis **A5** of the length.

Dymerski et al. teaches, in Figure 5, a polygonal length includes a twisted portion 208 to eliminate noise at the interface (col. 5, lines 50). Furthermore, it would have been obvious matter of design consideration to make the twist at different degrees as being dependent on the gap between the driving member and the driven member. Dymerski is concerned with noise caused between the gap of the interface thus a small gap between the untwisted part in the interference will require a lesser amount of twist to prevent noise. Therefore, as taught by Dymerski, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a twisted portion twisted along the axis and make the twist twisted from 10' to 1 degree to prevent noise.

Regarding claim 4, Dymerski teaches the twisted portion comprises a first twist **A20** in a first direction **A21** and a second twist **A22** in a direction opposite **A23** the first twist **A20** (see marked-up attachment to Figure 5).

Claims 1, 3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mezey, 3,733,937 (see marked-up attachment).

Regarding claim 1, Mezey discloses, in Figure 7, an interface between a driving member **24** and a driven member **44**. The driving member **24** has a polygonal length **38** having at least one surface selected from a group consisting concave and convex surfaces. The driven member **44** has a matching polygonal length **A4**. The polygonal length **38** or the matching polygonal length **A4** includes a twisted portion **30** twisted along an axis **A5** of the polygonal length **38** or the matching polygonal length **A4**.

However, Mezey fails to disclose the polygonal length **38** having at least one surface selected from a group consisting concave and convex; and, the twisted portion **30** being twisted from 10' to one degree. Mezey suggests that other configurations of the interface can be made (col. 3, line 50 to col. 4, line 2). Therefore, one applying the invention to Torx heads or sockets will find that the polygonal length will include a concave polygonal length. Furthermore, it would have been obvious matter of design consideration to make the twist at different degrees as being dependent on the gap between the driving member and the driven member. Mezey is concerned with slippage thus a small gap between the untwisted part in the interference will require a lesser amount of twist to prevent slippage as a result of the torque the twisted portion applies to the matching polygonal length. Therefore, as taught by Mezey, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the twist twisted from 10' to 1 degree to prevent slippage at lesser gaps between the untwisted portion of the driving member and the driven member.

Regarding claim 3, the matching polygonal length **A4** is a shaft having a male polygonal length

Regarding claim 5, the driven member **44** comprises a shaft having a male polygonal length with at least one portion of the length twisted from about 20' to about 50'.

Regarding claim 6, the driving member **24** or the driven member **44** is straight.

Regarding claim 7, given the obvious modification, the polygonal length **38** will inherently have a relative eccentricity of from about 1.5% to about 4%.

Regarding claim 8, given the obvious modification, the driven member **1** comprises a shaft having a concave male polygonal length with a number of sides selected from the group consisting 3 to 12.

Claims 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasudeva, 5,927,165, and Mezey, 3,733,937, in view of Stone, 4,277,107.

Regarding claim 10, Vasudeva discloses the driven member **1** comprises a shaft. However, Vasudeva fails to disclose the driving member comprising a flange. Stone teaches, in Figure 4, a driving member **60** comprises a flange **61** as part of a head of

the driving member to fasten components. Therefore, as taught by Stone, it would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise the driving member with a flange as part of a head to fasten components (see Figure 3).

Regarding claim 15, Vasudeva, as discussed above fails to disclose the mounting device comprises a flange. Stone teaches, in Figure 4, a driving member **60** comprises a flange **61** as part of a head of the driving member to fasten components. Therefore, as taught by Stone, it would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise the driving member with a flange as part of a head to fasten components (see Figure 3).

Response to Arguments

Applicant's arguments with respect to claims 1, 3-25, 30, 32 and 33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernesto Garcia whose telephone number is 703-308-8606. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on 703-308-2686. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel P Stodola

E.G.

May 6, 2004

DANIEL P. STODOLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

Attachments: one marked-up copy of applicant's Figure 10;
one marked-up copy of Mezey, 3,733,937;
one marked-up copy of Vasudeva, 5,927,165; and,
one marked-up copy of Dymerski et al., 6,533,235

Attachment A

Fig. 10

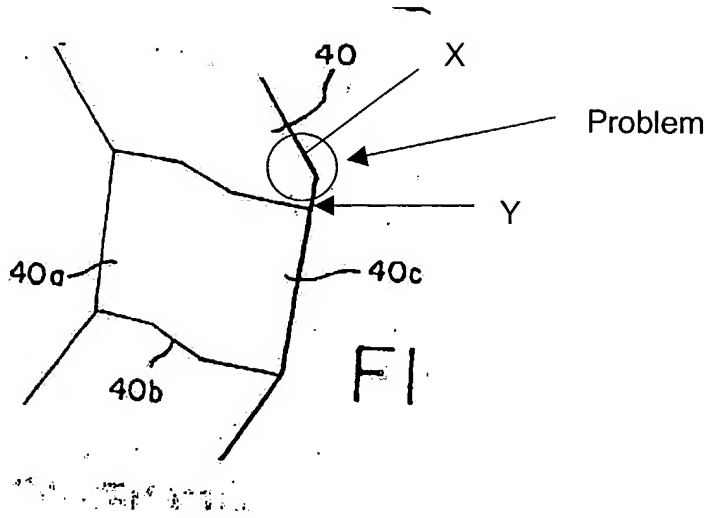
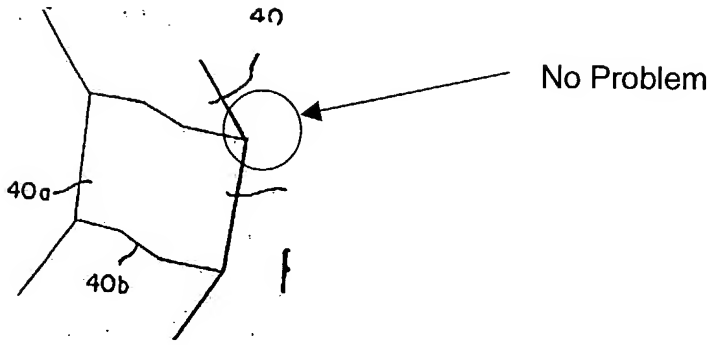


Fig. 10 should be



3,733,937 (Mezey)

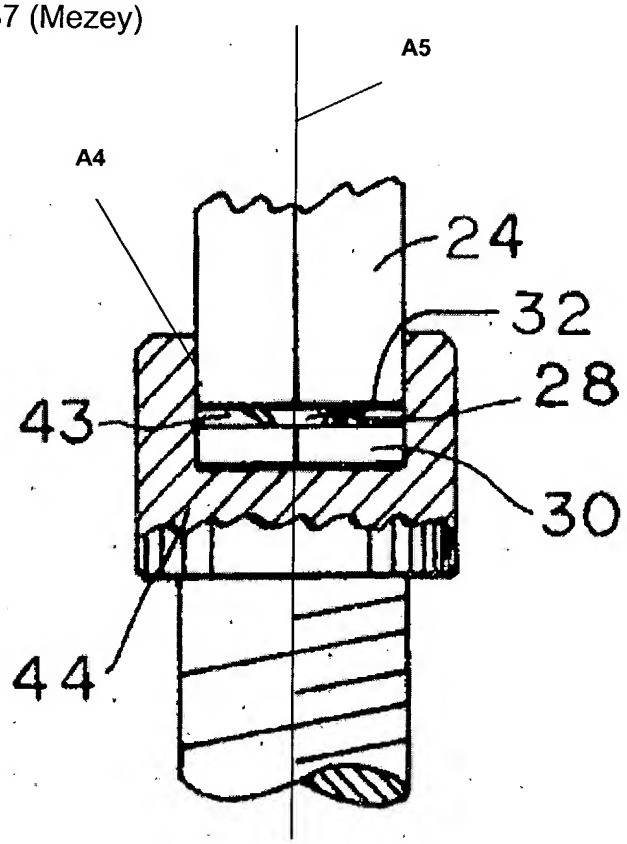


Fig. 7

5,927,165 (Vasudeva)

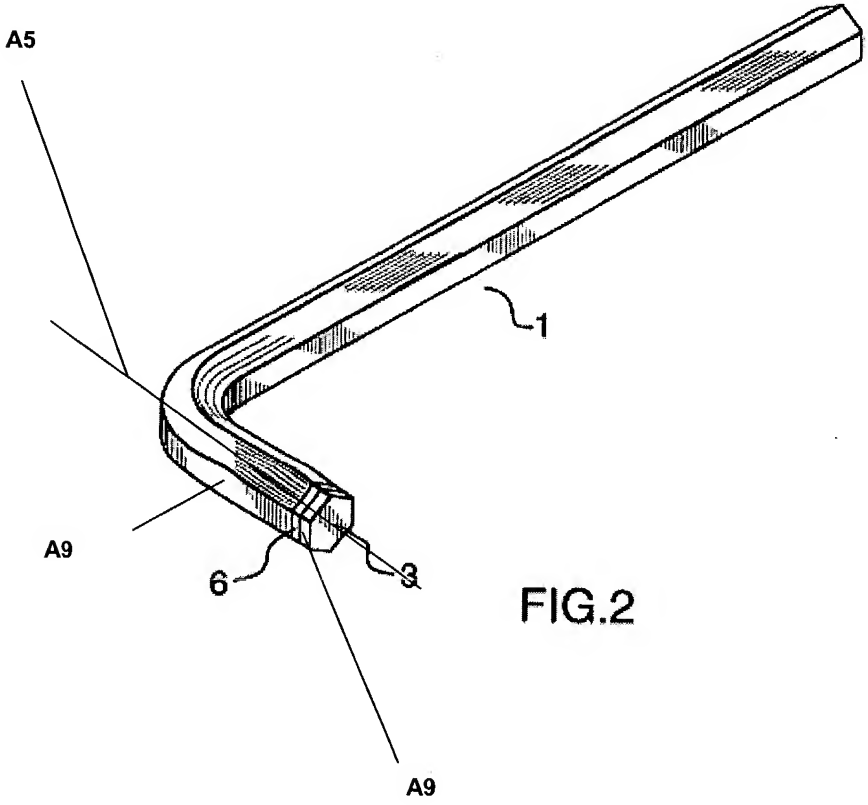


FIG.2

6,533,235 (Dymerski et al.)

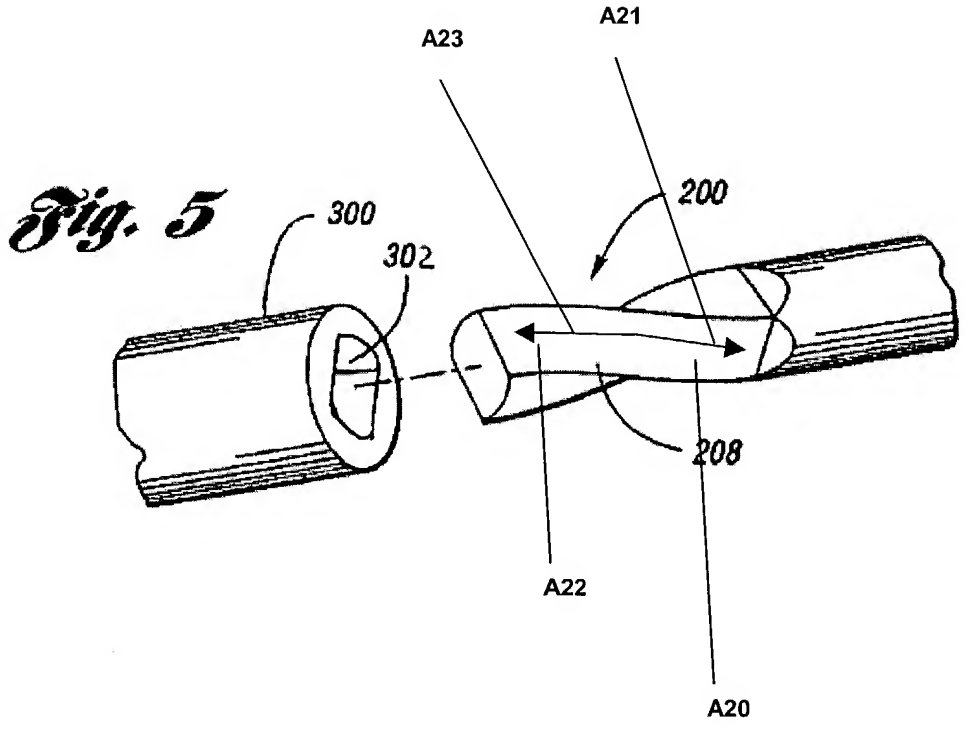


Fig. 5